REMARKS

Summary of Office Action

Claims 10-13 and 34-37 and 62 are all the claims pending in the application. Claims 10-13 and 34-37 presently stand rejected. Applicants add claim 62 to further define the invention as discussed more fully below.

Applicant thanks the Examiner for acknowledging Applicants' claim to foreign priority and for indicating receipt of the certified copy of the Priority Document from the International Bureau.

Further, Applicant thanks the Examiner for returning the initialed Forms PTO/SB/08 filed with the Information Disclosure Statements on November 14, 2003 and July 16, 2004.

Claims 10-13 are rejected under 35 U.S.C. § 102(b) as being anticipated by Sonozaki et al. (6,106,973).

Claims 10-13 are rejected under 35 U.S.C. § 102(e) as being anticipated by Hatta et al. (6,797,430).

Claims 34, 35 and 37 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Hatazawa et al. (6,428,934).

Claim 36 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Hatazawa et al. (6,428,934) in view of Hatta et al. (6,797,430).

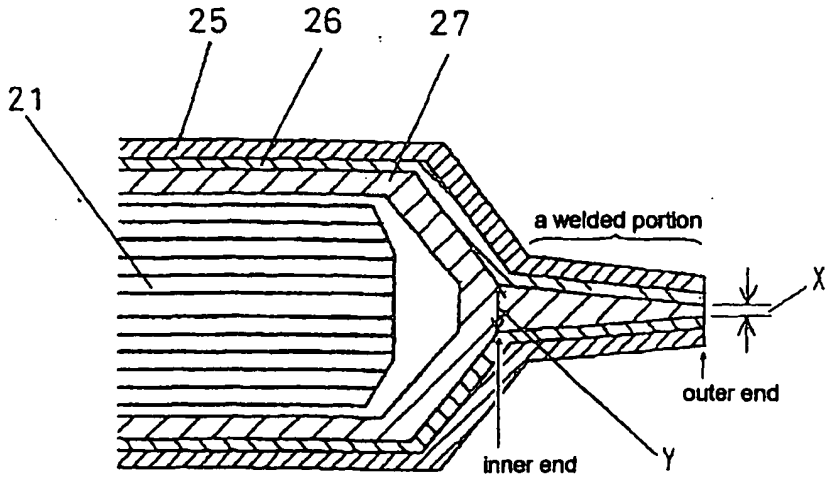
Analysis of the Pending Claims in View of the Prior Art

Claims 10-13 of the present invention are rejected as being anticipated by US 6,106,973 (Sonozaki et al.) under 35 U.S.C. § 102(b).

Applicants note that the present case is a divisional application, whereby the US filing date is that of the original application. Accordingly, this rejection should be under § 102(e) instead of 102(b).

Applicants amend claim 10 of the present invention to facilitate a clearer understanding of the present invention.

More particularly, claim 10 has been amended to clarify the welded portion which comprises the resin sheets superimposed in such a manner that the heat fused layers of the resin sheets touch each other to be integrated together. Fig. 9 of the originally filed application supports this amendment. (See also, section B-B' of Fig. 4.) An annotated Fig. 9 is shown below.



Specifically, the resin sheet forms a battery case and comprises three layers (surface protective layer (25), a metal barrier layer (26) and a heat fused layer (27)) as set forth on page 29, lines 12 to 21 of the originally filed specification.

In a welded portion, the two resin sheets are superimposed and welded so that the heat fused layers (27) among these three layers, touch each other. Thus, the two heat fused layers are unified at the welded portion as shown.

The total thickness of the heat-fused layers at the inner end of the welded portion (Y in the drawing above) is larger than that of the heat fused layers at the outer end (X in the drawing above).

When the total thickness of the heat-fused layers at the inner end in the welded portion (Y of the foregoing drawing) is larger than the total thickness of the heat fused layers at the outer end (X of the foregoing drawing), an excellent effect is exhibited in comparison with the opposite case where X is larger than Y. Specifically, the following explanation will be helpful.

The welded portion of a battery, which uses resin sheets as the battery case, plays the role of a safety valve. Namely, when the inner pressure of the battery rises, the welded portion opens to release the elevated inner pressure.

In this connection, in the case where X is smaller than Y (i.e. $X<Y$) as in claim 10 of the present invention, the inner end will not open, keeping its original configuration until the pressure reaches the value at which the welded portion should operate as a safety valve, and the heat-fused layers open between the inner end and the outer end all at once at the moment when

the pressure reaches the value at which the welded portion should operate as a safety valve, thus capable of releasing the inner pressure. This is an excellent model of a safety valve.

In contrast, when X is larger than Y (i.e. X>Y), the inner end tends to open before the pressure reaches the value at which the welded portion should operate as a safety valve, whereby the heat fused layers do not open all at once between the inner end and the outer end because along with the cleavage (opening) of the heat fused layer gradually occurring from the inner end side, the thickness of the heat fused layers become larger, making the cleavage of the heat fused layers more difficult. Due to such a mechanism, the function as a safety valve to release the inner pressure cannot be accomplished.

Thus, according to claim 10, the present invention provides a distinct advantage of functioning as a safety valve. Such an advantage cannot be attained with the battery structure disclosed in Sonozaki et al. and Hatta et al., as discussed below.

Sonozaki fails to teach or suggest this structure in which the inner portion is welded to be thicker than the outer portion for the heat fused layers. In particular, Fig. 7 (reference 44) does not disclose this structure. Moreover, the remaining portions of Sonozaki fail to teach or suggest this structure.

Thus, claim 10 is not anticipated by Sonozaki. Moreover, claims 11-13 are not anticipated by Sonozaki for at least the same reasons as claim 10, by virtue of their dependency therefrom.

Claims 10-13 are rejected as being anticipated by US 6,797,430 (Hatta et al.).

However, Hatta fails to teach or suggest the welded structure discussed above and recited in amended claim 10.

Col. 2, lines 46 to 53 of Hatta et al. merely disclose a general welding method for a battery having a battery case made of a laminate film. The remaining portions of Hatta et al. also fail to teach or suggest the feature of claim 10, in which two heat-fused layers are welded together so that the thickness of the outer portion is less than the inner portion.

In view of the foregoing, claim 10 is not anticipated by Hatta et al. Moreover, claims 11-13 are not anticipated by Hatta et al. due to their dependency from claim 10.

Claims 34, 35 and 37 are rejected as being unpatentable over Hatazawa et al. (US 6,428,934).

Applicants amend claim 34 to clarify that the lead terminal is bent at the outside of the battery case. In contrast thereto, the lead terminal of Hatazawa et al. is only bent in the inside of the battery case. Moreover, in Hatazawa et al., there is no teaching or suggestion that would motivate one of ordinary skill in the art to bend the lead terminal at the outside of the battery case.

Still further, Applicants submit that it would not have been obvious to bend the terminals at the outside of the terminal as a routine skill in the art since there is no teaching or suggestion in the prior art that this modification would provide an "optimum fit" as asserted by the Examiner.

Still further, there is no teaching or suggestion of providing the particular bent radius of 0.5 – 4mm, as recited in claim 34.

In view of the foregoing, claim 34 is not rendered obvious by Hatazawa et al.

Moreover, claims 35 and 37 are patentable for at least the same reasons as claim 34, by virtue of their dependency therefrom.

Still further, regarding claim 36, Applicants note that Hatta et al. does not cure the deficiencies of Hatazawa et al. Thus, one of ordinary skill in the art would not have been motivated to bend the terminals on the outside of the battery case at the recited radius. Thus, claim 36 is patentable for at least these reasons.

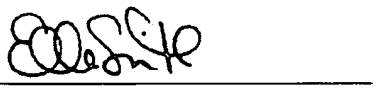
Finally, Applicants add claim 62 to further define the invention. Claim 62 is supported by Fig. 18 of the originally filed application, and this structure is not taught or suggested in the cited prior art for the reasons discussed above regarding Hatazawa et al. Moreover, there is no teaching or suggestion that would motivate one of ordinary skill in the art to remove the bent portion on the inside of the case and to form the bent portion only on the outside of the case. Moreover, this claim is patentable for at least the same reasons as claim 34, due to its dependency therefrom.

Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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